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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,392	02/02/2001	James Maligeorgos	M-12181 US	1417

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EXAMINER

CHANG, JOSEPH

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 04/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/776,392

Applicant(s)

MALIGEORGOS, JAMES

Examiner

Joseph Chang

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Am

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

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DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the "controllable capacitor, controllable inductor and controllable resistor" as it relates to the claims 7-9 and 17-19.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7,9-12, 14-17,19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Behbahani et al. "An adjustable Bipolar quadrature LO Generator with an improved Divide-by-2 stage," IEEE, 1996.

The Behbahani et al. reference discloses an adjustable bipolar quadrature LO Generator (Figure 1-8) comprising ECL divide-by -2 stage (Figure 6, for each stage see Figure 5)(delay stages I and Q) each stages having an input (V BIAS, V CONT) for controlling the phase delay of the respective stage (see Fig. 7).

Regarding Claim 2, the structure of divide-by-2 stage is a regenerative frequency divider because output of Q stage provides positive feedback (regenerative) into I stage.

Regarding Claim 3, preamble recitations are mere statement of purpose or use. The prior art structure is capable of performing the intended use as recited in the preamble.

Regarding Claim 4, the structure of divide-by-2 stage shown in figure 6 is a ring oscillator having two delay stages with varying a phase delay (using control voltage V BIAS and V CONT).

Regarding Claims 5 and 6, the Q1 and Q2 shown in Fig. 6 corresponds to "a current source couple to the input " in addition to I CONT.

Regarding Claims 7 and 9, a controllable capacitor and resistor (C1, R1, Rin, C2, R2).

Regarding Claims 10-11, Figure 6 shows I and Q stages have emitter-coupled differential amplifiers.

Regarding Claim 12, Figure 6 shows the structure that an oscillation frequency equal to half of the input frequency (Figure 2 shows input clock vs output I and Q).

Regarding Claim 13, due to a differential input structure of the generator the phase shift calibrated at one input frequency (by V BIAS=1.23) does not to be re-calibrated at a second input frequency (by V CONT).

Regarding Claim 14, the structure of divide-by-2 stage (ring oscillator) with phase adjustment V Bias and V CONT allows only phase adjustment and the frequency of the ring oscillator will not vary because the output natural frequency determines number of delay stages which is fixed as two.

Regarding Claim 15, due to a differential input structure of the generator, a first input (left, V BIAS) is differentially varied with respect to a second input (right, V CONT).

Regarding Claim 16, the Q1 and Q2 shown in Fig. 6 corresponds to a first and second input respectively.

Regarding Claims 17 and 19, a controllable capacitor and resister (C1, R1, Rin, C2, R2).

Regarding Claims 20-22, the method claims are the same in scope as in apparatus claims 4,5,10, and for Claim 22, the divide-by-2 stage (ring oscillator) is a differential oscillator because both input and output are differential.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 8, 18, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over ^{David, Saeed et al.} Behbahani et al. (above) in view of Behbahani et al. "Level-Locked Loop, a Technique for Broadband Quadrature Signal Generation".

As noted above, the "Bipolar Quadrature LO Generator" reference discloses a bipolar quadrature LO Generator as recited in the claims including quadrature output phase error correction. However, the reference does not explicitly disclose that the quadrature output phase error correction with a resolution of less than 1 degree.

The "Level-Locked Loop, a Technique for Broadband Quadrature Signal Generation" reference discloses that a method of level-locked loop using a divide-by-2 stage would achieve a phase accuracy better than 0.5 degree (Abstract).

Accordingly, it would have been obvious to one of ordinary skill in the art to utilize the method disclosed in the reference because such a method would have been provided much accuracy in phase error (Claim 23).

Regarding Claim 8 and 18, having inductors coupled to the input would have been obvious based on desired input signal consideration because inductors are sensitive to the frequency of input signal.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Straub et al. discloses a quadrature oscillator with phase error correction.

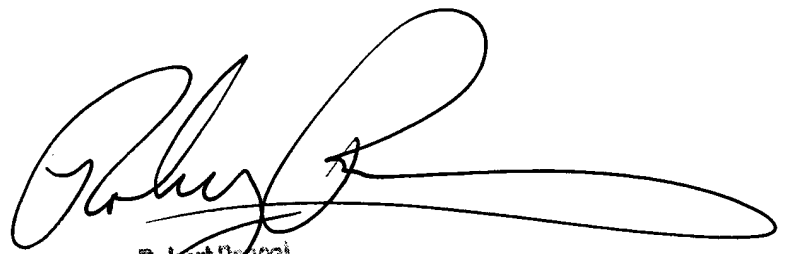
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Chang whose telephone number is 571 272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JC
3/26/04.



Robert Pascal
Supervisory Patent Examiner
Technology Center 2800